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(54) CONJUGATE NONWOVEN FABRIC OF CUPRAMMONIUM RAYON FILAMENT AND IT PRODUCTION

(57)Abstract:
PURPOSE: To obtain conjugate nonwoven fabric having excellent biodegradability and water absorption properties, rigidity suitable for handling and processing in a dry state, proper flexibility and handleability in a wet state and an excellent feeling of thickness and to provide a method for producing the conjugate nonwoven fabric.
CONSTITUTION: This conjugate nonwoven fabric of cuprammonium rayon filament in which a nonwoven fabric comprising cuprammonium rayon interlaced by high-pressure water column flow treatment is laminated to at least one side of a wood pulp fiber layer and these fibers are mutually interlaced is produced by laminating a wood pulp sheet to nonwoven fabric of cuprammonium rayon filament, optionally laminating nonwoven fabric of cuprammonium rayon filament to the obtained laminate to give a laminate, subjecting the laminate to high-pressure water column flow treatment to interlace the pulp fibers with the cuprammonium rayon filament and integrating the layers by the treatment.

* NOTICES *

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2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application]This invention has biodegradability and relates to a cuprammonium rayon continuous glass fiber composite nonwoven fabric excellent in absorptivity, and a manufacturing method for the same. If it states in more detail, this invention in dryness. It has good handling nature and rigidity suitable for processing, and in a damp or wet condition, when it has the outstanding thick feeling and it not only has moderate pliability and good handling nature, but lays under the ground middle class, it is related with a cuprammonium rayon continuous glass fiber composite nonwoven fabric in which decomposition by a microorganism is possible, and a manufacturing method for the same.
[0002]
[Description of the Prior Art]The method of confounding staple fibers and obtaining a nonwoven fabric is known from the former by opening a rayon staple fiber and cotton textiles with a carding machine, and laminating to mat state, next performing high-pressure-water pillar style processing to this.
the product -- a wiper -- or it wipes and is used as cloth etc.
However, since the dryness of the nonwoven fabric produced by doing in this way was also flexible, when processing it into this, it is easy to generate a trouble, and in a damp or wet condition, it becomes soft too much, there is a fault that handling nature is inferior, and, moreover, it had the problem that the upper price was also high.
[0003]On the other hand, while making it flow down on a base material as a curtain wall style with a solidified solution, the continuous filament-like style of a large number which extruded the cuprammonium rayon undiluted solution and were formed from many spinning holes, A cuprammonium rayon continuous glass fiber aggregate is formed on a base material, intersecting perpendicularly with this base material with the direction of movement, and giving

rocking movement to right and left, Subsequently, the method of performing high-pressure-water pillar style processing from on this cuprammonium rayon continuous glass fiber aggregate if needed, drying cuprammonium rayon continuous glass fiber, after carrying out stream confounding, and obtaining a nonwoven fabric after a scouring process, is also known. In the damp or wet condition, the cuprammonium rayon continuous glass fiber nonwoven fabric obtained by this method also becomes soft too much, is inferior in handling nature, and has the fault that a thick feeling is missing.

[0004]Give a stream **** reliance confounding method to the layered product of two or more fibrous sheets, textiles are made to confound, and various methods of obtaining a composite-ized nonwoven fabric by it are known. For example, the manufacturing method of the composite nonwoven fabric which bound the staple rayon fiber layer and the wood-pulp-fibers layer to both sides of the polyethylene terephthalate continuous filament layer is indicated by United States Patent specification No. 3,493,462.

The manufacturing method of the composite nonwoven fabric which carried out lamination binding of a synthetic fiber staple layer and the natural staple fiber layer is indicated by JP,3-268936,A to one side or both sides of the nonwoven fabric which consist of a synthetic fiber continuous filament.

The manufacturing method of the composite nonwoven fabric in which the spun bond nonwoven fabric layer which consists of synthetic fibers, and the pulp sheet layer were laminated is indicated by JP,5-253160,A.

[0005]These conventional composite nonwoven fabrics are soft also in desiccation and which a humid state, and do not fit the use as which high stiffness is required by dryness. When neither has perfect biodegradability but uses these nonwoven fabrics so much, the problem of generating garbage may be produced.

[0006]

[Problem(s) to be Solved by the Invention]In view of this actual condition, this invention persons examined many things, in order to solve the above-mentioned fault. As a result, with the composite nonwoven fabric which unified the pulp sheet which consists of a specific cuprammonium rayon continuous glass fiber nonwoven fabric and wood pulp by three-dimensional confounding of these textiles, it found out that the above-mentioned fault was effectively cancelable, and this invention was completed.

[0007]Namely, this invention cancels the above-mentioned fault of conventional technology, and it has biodegradability, Since the cuprammonium rayon continuous glass fiber and the pulp fiber which are excellent in absorptivity and a thick feeling, have the stiffness which was suitable for various processings at the time of desiccation, and have moderate pliability and good handling nature at the time of humidity, and constitute a nonwoven fabric are carrying out the slip coalition efficiently, It is going to provide a cuprammonium rayon continuous glass fiber

composite nonwoven fabric which has the strong point in which there are few rear surface differences, and a manufacturing method for the same.

[0008]

[Means for Solving the Problem]An aforementioned problem is solvable with a cuprammonium rayon continuous glass fiber composite nonwoven fabric concerning this invention, and a manufacturing method for the same.

[0009]A pulp fiber layer which a cuprammonium rayon continuous glass fiber composite nonwoven fabric of this invention becomes from wood pulp fibers, It has at least one-layer cuprammonium rayon continuous glass fiber layer which is laminated on the 1st [at least] page of this pulp fiber layer, and consists of cuprammonium rayon continuous glass fiber, Cuprammonium rayon continuous glass fiber in said cuprammonium rayon continuous glass fiber layer interlaces mutually, and it advances into said pulp fiber layer, and interlaces also with the pulp fiber, and three-dimensional interlaced structure of said cuprammonium rayon continuous glass fiber and a pulp fiber is formed of it.

[0010]A cuprammonium rayon continuous glass fiber composite nonwoven fabric of this invention may consist of an one layer pulp fiber layer and an one-layer cuprammonium rayon continuous glass fiber layer by which lamination union was carried out on the one side.

[0011]A cuprammonium rayon continuous glass fiber composite nonwoven fabric of this invention may consist of an one-layer pulp fiber layer and a two-layer cuprammonium rayon continuous glass fiber layer by which lamination union was carried out on the both sides.

[0012]A manufacturing method of a cuprammonium rayon continuous glass fiber composite nonwoven fabric concerning this invention, From many spinning holes, extrude a cuprammonium rayon undiluted solution and a filament shape style of a cuprammonium rayon undiluted solution of these extruded large number, Form a curtain wall-like style with a solidified solution which contacts it and is solidified, and this curtain wall-like style, going on to a certain direction. It is made to flow down to this direction of movement on a base material rocked in the direction which crosses almost horizontally, On this base material, a textiles lamination layer sheet-like thing of solidified cuprammonium rayon continuous glass fiber is formed, Spurt out and apply many high-pressure-water pillar styles to said sheet like object, and said cuprammonium rayon continuous glass fiber mutually, Make it confound at random, dry an acquired cuprammonium rayon continuous glass fiber sheet-shaped interlaced object, and a cuprammonium rayon continuous glass fiber nonwoven fabric is produced, Carry out wet paper making of the wood pulp independently, produce a pulp fiber sheet, and on the 1st [at least] page of said pulp fiber sheet, Laminate said cuprammonium rayon continuous glass fiber nonwoven fabric, spurt out and apply a high-pressure-water pillar style to this layered product from at least oneth side of them, a pulp fiber and said cuprammonium rayon continuous glass fiber in said layered product are made to confound in three dimensions, and

a composite nonwoven fabric of one is formed.

[0013]In a manufacturing method of a cuprammonium rayon continuous glass fiber composite nonwoven fabric of this invention, said cuprammonium rayon continuous glass fiber nonwoven fabric may be laminated on one side of said pulp fiber sheet, and said high-pressure-water pillar style **** reliance processing may be performed to this layered product from that pulp fiber layer side.

[0014]In a manufacturing method of a cuprammonium rayon continuous glass fiber composite nonwoven fabric of this invention, said cuprammonium rayon continuous glass fiber nonwoven fabric may be laminated on both sides of said pulp fiber sheet, and said high-pressure-water pillar style **** reliance processing may be performed to this layered product from the that one side or both-sides side.

[0015]In a manufacturing method of a cuprammonium rayon continuous glass fiber composite nonwoven fabric of said this invention, it is preferred to perform scouring treatment to a sheet-shaped polymer of cuprammonium rayon continuous glass fiber formed on said base material.

[0016]

[Function]In order to manufacture the cuprammonium rayon continuous glass fiber nonwoven fabric used in the composite nonwoven fabric of this invention, A cuprammonium rayon undiluted solution is extruded through many spinning holes, and since the continuous filament-like style of these extruded large number is contacted to a solidified solution and solidified, it is made to flow down on a base material as a curtain wall-like style together with this. At this time, a base material is advanced to a certain direction, and swinging-right-and-left movement which crosses almost at a level with this direction of movement is given. Then, the textiles lamination layer sheet-like thing of cuprammonium rayon continuous glass fiber is formed on a base material. After performing high-pressure-water pillar style processing to this cuprammonium rayon continuous glass fiber aggregate from that upper part after performing scouring treatment, and making this sheet like object confound cuprammonium rayon continuous glass fiber of each other, a cuprammonium rayon continuous glass fiber nonwoven fabric is obtained by drying this. What is marketed (for example, a trade name: Bemliese, Asahi Chemical Industry Co., Ltd. make) can be used for such a cuprammonium rayon continuous glass fiber nonwoven fabric.

[0017]the eyes of a cuprammonium rayon continuous glass fiber nonwoven fabric usable to this invention -- 10 - 100 g/m^2 -- it is 13 - 60 g/m^2 preferably. When these eyes are less than 10g[/m]^2, it is sometimes difficult to be stabilized and to manufacture the good cuprammonium rayon continuous glass fiber nonwoven fabric of formation. On the contrary, when the eyes of a cuprammonium rayon continuous glass fiber nonwoven fabric exceed 100 g/m^2, confounding with the pulp fiber and cuprammonium rayon continuous glass fiber by a

high-pressure-water pillar style may become difficult.

[0018]In one embodiment of this invention, said cuprammonium rayon continuous glass fiber nonwoven fabric, It is laid on porous support like a plastic wire or a stainless wire, Laminate a wood-pulp-fibers sheet on this cuprammonium rayon continuous glass fiber nonwoven fabric, perform high-pressure-water pillar style processing toward a rear face from the surface of this layered product, a pulp fiber and cuprammonium rayon continuous glass fiber are made to confound, and a composite nonwoven fabric is produced.

[0019]In other embodiments of this invention, a wood-pulp-fibers sheet is laminated on a cuprammonium rayon continuous glass fiber nonwoven fabric as mentioned above, It is considered as the layered product which laminates another cuprammonium rayon continuous glass fiber nonwoven fabric, and consists of three layers on this wood-pulp-fibers sheet, Said textiles are made to confound by performing high-pressure-water pillar style processing toward a rear face from that surface, a composite nonwoven fabric can be obtained, and after performing high-pressure-water pillar style processing from the surface of a layered product, high-pressure-water pillar style processing may be further performed again from the rear face of a layered product as occasion demands in this case.

[0020]The cuprammonium rayon continuous glass fiber composite nonwoven fabric of this invention The above cuprammonium rayon continuous glass fiber nonwoven fabric layers, It may be the two-layer laminated material which becomes it from the wood-pulp-fibers layer which united by high-pressure-water pillar style processing, or may be the three-layer laminated material which consists of a two-layer cuprammonium rayon continuous glass fiber nonwoven fabric layer and a wood-pulp-fibers layer which was pinched between them and united by high-pressure-water pillar style processing.

[0021]The wood-pulp-fibers sheet used in this invention is obtained by carrying out wet paper making of the wood pulp. As wood pulp, a publicly known thing can be used arbitrarily. For example, the chemical pulp textiles produced by carrying out digestion of a needle-leaf tree or the broad-leaved tree wood by kraft process, soda process, the polysulfide method, etc., or mechanical pulp textiles, such as a grand pulp fiber and thermomechanical-pulp textiles, ~ it can be used, being able to be independent or mixing in the state of [non-bleached] **.

[0022]Although the basis weight of a wood-pulp-fibers sheet is a matter which can be set up suitably, it is preferred that the value measured by the method especially shown in JIS P 8124 is the range of 10 - 120 g/m^2. Since there is little absolute magnitude of the pulp fiber in the composite nonwoven fabric in which the basis weight of a wood pulp sheet is obtained by less than 10 g/m^2, the dimension height of the composite nonwoven fabric obtained may be insufficient. On the contrary, if the basis weight of a wood pulp sheet exceeds 120 g/m^2, When a high-pressure-water pillar style is given to the layered product which has too much absolute

magnitude of pulp and in which it contains a wood pulp sheet, dissociation of the pulp fiber in a pulp sheet may become difficult, and, for this reason, it may become insufficient confounding with cuprammonium rayon continuous glass fiber and a pulp fiber.

[0023]The density (it measures by the method of JIS P 8118) of a wood-pulp-fibers sheet is 0.2 - 0.65 g/cm^3 preferably. When the density of a wood-pulp-fibers sheet exceeds 0.65 g/cm^3, when a high-pressure-water pillar style is given, movement of a pulp fiber may be controlled, and interlacement with cuprammonium rayon continuous glass fiber and pulp may become less enough. When said density is less than 0.2 g/cm^3, manufacture of such a pulp fiber sheet is difficult in practice.

[0024]As for the humid tensile strength (it measures about a 25-mm-wide specimen by the method of JIS P 8135) of a wood-pulp-fibers sheet, it is preferred that it is in the range of 0.04 - 1.5kgf, and it is the range of 0.04 - 1.0kgf more preferably. When humid tensile strength is less than 0.04 kgf and high-pressure-water pillar style processing is performed, it may become difficult for a sheet to be easily destroyed also by scattering of water by contact with a column-of-water style again, and for a hole opening and out of paper to arise, and for it to be stabilized and to manufacture a composite nonwoven fabric continuously. On the other hand, when humid paper durability intensity exceeds 1.5kgf, even if it gives a high-pressure-water pillar style, it is sometimes difficult for the pulp which constitutes the pulp fiber sheet to be unable to isolate easily, therefore to make cuprammonium rayon continuous glass fiber and a pulp fiber fully confound.

[0025]In the composite nonwoven fabric of this invention, as for the wt. ratio (ratio of the basis weight measured by the method of JIS P 8124) of a pulp fiber sheet ingredient and a cuprammonium rayon continuous glass fiber nonwoven fabric ingredient, it is preferred that it is 1:0.1-3, and it is 1:0.2-2 more preferably. Pulp-fiber sheet: When the ratio of cuprammonium rayon continuous glass fiber nonwoven fabric weight exceeds 1:0.1 and the content of a cuprammonium rayon continuous glass fiber nonwoven fabric becomes small too much, the ratio of the pulp fiber in the obtained composite nonwoven fabric may become high too much, and the pliability at the time of humidity may become insufficient. On the contrary, a pulp sheet: The ratio of the pulp fiber in the composite nonwoven fabric in which the ratio of a cuprammonium rayon continuous glass fiber nonwoven fabric will be obtained if the content of a cuprammonium rayon continuous glass fiber nonwoven fabric becomes large too much exceeding 1:3 becomes low too much and a loft not only falls, but it may become a cause of a cost hike.

[0026]In the case of the layered product which the whole basis weight is in the range of 20 - 200 g/m^2 in consideration of the constituent conditions described above in the case of the layered product which consists of two-layer, and consists of three layers, it is preferred to be

adjusted to the range of 30 - 200 g/m^2. When basis weight is lower than the lower limit of said range, a layered product may be unable to form well and basis weight exceeds 200 g/m^2, confounding of the textiles by the following high-pressure-water pillar style may become insufficient.

[0027]The high-pressure-water pillar style used for this invention lets the nozzle hole of a detailed diameter pass, and it is obtained by making water blow off with high voltage.

For example, let the nozzle hole of 0.05-0.2-mm detailed a large number pass preferably, and it is made for 0.05-0.3 mm in an aperture to blow off by the pressure of 20-200kg[/cm]^2, and is obtained.

When this column-of-water style is spurted out and applied to said layered product, a column-of-water style breaks and a pulp fiber sheet a column-of-water style, While isolating the pulp fiber which constitutes a pulp fiber sheet, A pulp fiber and the cuprammonium rayon continuous glass fiber which constitutes a cuprammonium rayon continuous glass fiber nonwoven fabric are made to cause modification of bending, torsion, etc., subsequently to ' pulp fiber, or cuprammonium rayon continuous glass fiber kinetic energy is fully given, and these textiles are made to produce random movement. As a result, pulp fibers, cuprammonium rayon continuous glass fibers and a pulp fiber, and cuprammonium rayon continuous glass fiber become entangled by these compound operations, and a layered product unifies by confounding.

[0028]In this case, the aforementioned cuprammonium rayon continuous glass fiber nonwoven fabric used for this invention bonds a synthetic fiber by thermo-compression in the shape of dispersion, and since combination between cuprammonium rayon continuous glass fibers is weak compared with the spun bond nonwoven fabric in which between textiles was fixed firmly, that set layer is easily destroyed by the high-pressure-water pillar style. For this reason, the flexibility of each cuprammonium rayon continuous glass fiber which constitutes the cuprammonium rayon continuous glass fiber nonwoven fabric used by this invention is very large, Since it interlaces with the pulp fiber of short fiber shape efficiently, and there are few rear surface differences, there is a thick feeling and the hydrogen bond of pulp is efficiently arranged at the whole sheet at the time of desiccation, It has stiffness suitable for various processings, and moderate pliability and handling nature can be held by existence of a pulp fiber also at the time of humidity. The composite nonwoven fabric after high-pressure-water pillar style processing is dried with a publicly known dryer.

[0029]

[Example]The following example explains this invention concretely. However, of course, this invention is not limited to these examples. In the following example, as long as there is no notice in particular, a "ratio" and all "%" are a "weight ratio" and "% of the weight."

[0030]On the cuprammonium rayon continuous glass fiber nonwoven fabric (trade name: Bemliese SF184, Asahi Chemical Industry Co., Ltd. make) of basis weight 18.5 g/m^2 which consists of a continuous filament of a large number produced by carrying out spinning of the example 1 cuprammonium-rayon undiluted solution, The pulp fiber sheet produced by carrying out wet paper making of the needle-leaved tree bleached kraft pulp was laminated, and the layered product was formed. The basis weight of this pulp fiber sheet was 29 g/m^2, and densities were 0.50 g/cm^3 and humid tensile strength 0.10kgf. The ratio of a pulp fiber sheet and a cuprammonium rayon continuous glass fiber nonwoven fabric was 1:0.64. Next, carrying this layered product on the transportation belt which consists of a polyester wire, and making it transport the speed for 30-m/so that a pulp fiber sheet layer may turn up. The high-pressure-water pillar style was spurted out and put in the water pressure of 50 kg/cm^2 so that a cuprammonium rayon continuous glass fiber nonwoven fabric (polyester wire side) might be penetrated from on a pulp fiber sheet. The aperture of the nozzle of a high-pressure-water pillar style was 0.15 mm, and the nozzle pitch was 1 mm. When the high-pressure-water-pillar-style-processed layered product was dried with the through dryer, the cuprammonium rayon continuous glass fiber composite nonwoven fabric of 45 g/m^2 was obtained for basis weight. The pulp fiber flow during the above-mentioned operation was small.

[0031]On the cuprammonium rayon continuous glass fiber nonwoven fabric (trade name: Bemliese SF184, Asahi Chemical Industry Co., Ltd. make) of basis weight 18.5 g/m^2 which consists of a continuous filament of a large number produced by carrying out spinning of the example 2 cuprammonium-rayon undiluted solution, The pulp fiber sheet produced by carrying out wet paper making of the needle-leaved tree bleached kraft pulp was laminated, and it was considered as the layered product. As for the basis weight of this pulp fiber sheet, 0.543 g/cm^3 and the humid tensile strength of 60 g/m^2 and density were 0.30kgf. The ratio of a pulp fiber sheet and a cuprammonium rayon continuous glass fiber nonwoven fabric was 1:0.31. Next, carrying this layered product on the transportation belt which consists of a polyester wire, and making it transport the speed for 15-m/so that a pulp fiber sheet layer may turn up. The high-pressure-water pillar style was spurted out and put in the water pressure of 80 kg/cm^2 like Example 1 so that a cuprammonium rayon continuous glass fiber nonwoven fabric (polyester wire side) might be penetrated from on a pulp fiber sheet. The aperture of the nozzle of a high-pressure-water pillar style was 0.15 mm, and the nozzle pitch was 1 mm. When the layered product after high-pressure-water pillar style processing was dried with the dryer, the cuprammonium rayon continuous glass fiber composite nonwoven fabric of 74.5 g/m^2 was obtained for basis weight. The pulp fiber flow during the above-mentioned operation was small.

[0032]The pulp fiber sheet produced by carrying out wet paper making of the needle-leaved tree bleached kraft pulp on the cuprammonium rayon continuous glass fiber nonwoven fabric (trade name: Bemliese SF302) of basis weight 27.5 g/m^2 which consists of a continuous filament of a large number produced by carrying out spinning of the example 3 cuprammonium-rayon undiluted solution was laminated. As for the basis weight of this pulp fiber sheet, 0.50 g/cm^3 and the humid tensile strength of 29 g/m^2 and density were 0.10kgf. The ratio of this pulp fiber sheet and a cuprammonium rayon continuous glass fiber nonwoven fabric was 1:0.95. Next, high-pressure-water pillar style processing was performed with the water pressure of 50 kg/cm^2 like Example 1 from on the pulp fiber sheet, carrying this layered product on the transportation belt which consists of a polyester wire, and making it transport the speed for 30-m/so that a pulp fiber sheet may be located in the upper part. The aperture of the nozzle of a high-pressure-water pillar style was 0.15 mm, and the nozzle pitch was 1 mm. When the layered product after high-pressure-water pillar style processing was dried with the dryer, the cuprammonium rayon continuous glass fiber composite nonwoven fabric of basis weight 54 g/m^2 was obtained. The pulp fiber flow under above-mentioned operation was small.

[0033]The pulp fiber sheet produced by carrying out wet paper making of the needle-leaved tree bleached kraft pulp on the cuprammonium rayon continuous glass fiber nonwoven fabric (trade name: Bemliese JF601) of basis weight 60 g/m^2 which consists of a continuous filament of a large number produced by carrying out spinning of the example 4 cuprammonium-rayon undiluted solution was laminated, and it was considered as the layered product. As for the basis weight of this pulp fiber sheet, 0.52 g/cm^3 and the humid tensile strength of 40 g/m^2 and density were 0.15kgf. The ratio of a pulp fiber sheet and a cuprammonium rayon continuous glass fiber nonwoven fabric was 1:1.5. Subsequently, high-pressure-water pillar style processing was performed with the water pressure of 80 kg/cm^2 like Example 1 from on the pulp sheet, carrying this layered product on the transportation belt which consists of a polyester wire, and making it transport the speed for 15-m/so that a pulp fiber sheet may be located upwards. The aperture of the nozzle of a high-pressure-water pillar style was 0.15 mm, and the nozzle pitch was 1 mm. When the layered product after high-pressure-water pillar style processing was dried with the dryer, the cuprammonium rayon continuous glass fiber composite nonwoven fabric of 95 g/m^2 was obtained for basis weight.
[0034]On the cuprammonium rayon continuous glass fiber nonwoven fabric (trade name: Bemliese SF184, Asahi Chemical Industry Co., Ltd. make) of basis weight 18.5 g/m^2 which consists of a continuous filament of a large number produced by carrying out spinning of the example 5 cuprammonium-rayon undiluted solution, The pulp fiber sheet produced by carrying

out wet paper making of the needle-leaved tree bleached kraft pulp was laminated, and it was considered as the layered product. As for the basis weight of this pulp fiber sheet, 0.55 g/cm^3 and the humid tensile strength of 90 g/m^2 and density were 0.42kgf. The ratio of a pulp fiber sheet and a cuprammonium rayon continuous glass fiber nonwoven fabric was 1:0.21. Next, high-pressure-water pillar style processing was performed with the water pressure of 100 kg/cm^2 towards the polyester wire from on the pulp sheet, carrying this layered product on the transportation belt which consists of a polyester wire, and making it transport the speed for 15-m/so that a pulp fiber sheet may be located upwards. The aperture of the nozzle of a high-pressure-water pillar style was 0.15 mm, and the nozzle pitch was 1 mm. When the layered product after high-pressure-water pillar style processing was dried with the dryer, the cuprammonium rayon continuous glass fiber composite nonwoven fabric of basis weight 103 g/m^2 was obtained.

[0035]On the cuprammonium rayon continuous glass fiber nonwoven fabric (trade name: Bemliese SF184, Asahi Chemical Industry Co., Ltd. make) of basis weight 18.5 g/m^2 which consists of a continuous filament of a large number produced by carrying out spinning of the example 6 cuprammonium-rayon undiluted solution, The pulp fiber sheet produced by carrying out wet paper making of the needle-leaved tree bleached kraft pulp was laminated. As for the basis weight of this pulp fiber sheet, 0.52 g/cm^3 and the humid tensile strength of 40 g/m^2 and density were 0.15kgf. Subsequently, the cuprammonium rayon continuous glass fiber nonwoven fabric (trade name: Bemliese SF184) which consists of a continuous filament of a large number produced on this pulp fiber sheet by carrying out spinning of the cuprammonium rayon undiluted solution of another basis weight 18.5 g/m^2 was laminated, and it was considered as the layered product which consists of three layers. The ratio of a pulp fiber sheet and a two-layer cuprammonium rayon continuous glass fiber nonwoven fabric was 1:0.93. Carrying this lamination layer sheet on the transportation belt which consists of a polyester wire, and making it transport the speed for 25-m/, from the surface of the lamination layer sheet, it continued after that and a rear face to the high-pressure-water pillar style processing same one by one as Example 1 was performed. The aperture of the nozzle of 70 kg/cm^2 and a high-pressure-water pillar style of the water pressure of the high-pressure-water pillar style was 0.15 mm, and the nozzle pitch was 1 mm. When the layered product after high-pressure-water pillar style processing was dried with the dryer, the cuprammonium rayon continuous glass fiber composite nonwoven fabric of basis weight 73 g/m^2 was obtained.

[0036]On the cuprammonium rayon continuous glass fiber nonwoven fabric (trade name: Bemliese SF184) of basis weight 18.5 g/m^2 which consists of a continuous filament of a large number produced by carrying out spinning of the example 7 cuprammonium-rayon undiluted

solution, The pulp fiber sheet produced by carrying out wet paper making of the mixed pulp which blended needle-leaved tree bleached kraft pulp and broad-leaved tree bleached kraft pulp at a rate of needle-leaf tree kraft pulp:broad-leaved tree kraft pulp =70:30 was laminated, and it was considered as the layered product. As for the basis weight of this pulp fiber sheet, 0.58 g/cm^3 and the humid tensile strength of 50 g/m^2 and density were 0.23kgf. The ratio of a pulp fiber sheet and a cuprammonium rayon nonwoven fabric was 1:0.37. Subsequently, high-pressure-water pillar style processing was carried out with the water pressure of 50kg[/cm]^2 like Example 1 from on the pulp fiber sheet, carrying this layered product on the transportation belt which consists of a polyester wire, and making it transport the speed for 20-m/so that a pulp fiber sheet may be located upwards. The aperture of the nozzle of a high-pressure-water pillar style was 0.15 mm, and the nozzle pitch was 1 mm. When the layered product after high-pressure-water pillar style processing was dried with the dryer, the cuprammonium rayon continuous glass fiber composite nonwoven fabric of basis weight 65 g/m^2 was obtained.

[0037]Instead of the reproduction continuous glass fiber nonwoven fabric which consists of a continuous filament of a large number produced by carrying out spinning of the comparative example 1 cuprammonium-rayon undiluted solution, the fineness of 2.3 deniers, Except for having used the polypropylene spun bond nonwoven fabric of basis weight ^{2} of 15g/m, operation of Example 1 was repeated and the composite nonwoven fabric of basis weight 42 g/m^2 was obtained.

[0038]Basis weight 18 g/m^2 produced by carrying out wet paper making of the comparative example 2 needle-leaved tree bleached kraft pulp, The pulp fiber sheet of density 0.28 g/cm^3 and humid tensile-strength 0.05kgf was used, operation of Example 4 was repeated except for having made the water pressure of the high-pressure-water pillar style into 50 kg/cm^2, and the cuprammonium rayon continuous glass fiber composite nonwoven fabric of basis weight 74 g/m^2 was obtained. The ratio of a pulp fiber sheet and a cuprammonium rayon continuous glass fiber nonwoven fabric was 1:3.3.

[0039]Basis weight 60 g/m^2 produced by carrying out wet paper making of the comparative example 3 needle-leaved tree bleached kraft pulp, Except for having used the softwood pulp fibrous sheet of density 0.72 g/cm^3 and humid tensile-strength 1.10kgf, operation of Example 2 was repeated and the cuprammonium rayon continuous glass fiber composite nonwoven fabric of basis weight 83 g/m^2 was obtained. The ratio of a pulp fiber sheet and a cuprammonium rayon continuous glass fiber nonwoven fabric was 1:0.46.

[0040]The cuprammonium rayon continuous glass fiber nonwoven fabric (trade name: Bemliese JS601, Asahi Chemical Industry Co., Ltd. make) of basis weight 60 g/m^2 which

consists of a continuous filament of a large number produced by carrying out spinning of the comparative example 4 cuprammonium-rayon undiluted solution was prepared.

[0041]After opening the comparative example 5 rayon staple fiber by the card method and making it mat state, the mat sheet of basis weight ^{2} of 60g/m which performed and produced high-pressure-water pillar style processing was prepared.

[0042]The spun bond nonwoven fabric of the fineness of 2.3 deniers and basis weight 60 g/m^2 which consist of a continuous filament of a large number which obtained it by carrying out melt spinning of the comparative example 6 polypropylene resin was prepared.

[0043]The sheet obtained by the test examples 1-7 and the comparative examples 1-6 was examined with the following test method, and the quality was evaluated. That is, absorptivity, the handling nature in a damp or wet condition, the processability in dryness, a thick feeling, and biodegradability were examined, and the examining method shown below using a sample offering nonwoven fabric and a sheet estimated the quality.

[0044]Visual evaluation of the earliness of water absorption when waterdrop is dropped on a test-method (1) absorptivity nonwoven fabric or a sheet was carried out. Evaluation was performed in the following five steps.

5 -- Absorptivity is very good.

4 -- Absorptivity is good.

3 -- Absorptivity is common.

2 -- Absorptivity is inferior.

1 -- It does not absorb water.

[0045](2) Organic functions estimated the nonwoven fabric after extracting lightly the handling nature nonwoven fabric or sheet of a damp or wet condition by a hand after being immersed in water, or the handling nature of the sheet. Evaluation was performed in the following five steps.

5 -- It is supple and handling nature is very good.

4 -- There is slight pliability and handling nature is good.

3 -- It is inflexible for a while and handling nature is common.

2 -- Pliability runs short for a while and handling nature is inferior.

1 -- Pliability runs short and handling nature is extremely inferior.

[0046](3) Organic functions estimated the nonwoven fabric after 24-hour gas conditioning, or the handling nature of the sheet in the air-conditioned room of the processability temperature of 20 ** in dryness, and 65% of relative humidity. Evaluation was performed in the following five steps.

5 -- There is stiffness and handling and processability are good.

4 -- There is slight stiffness and handling and processability are slightly good.

3 -- There is no stiffness for a while and handling and processability are common.

2 -- Stiffness runs short for a while and handling and processability are slightly poor.
1 -- Stiffness runs short and handling and processability are poor.
[0047](4) Organic functions estimated the nonwoven fabric after 24-hour gas conditioning, or the thick feeling of the sheet in the air-conditioned room of 20 ** of thick thermal-sensing degree, and 65% of relative humidity. Evaluation was performed in the following five steps.
5 -- A thick feeling is good.
4 -- A thick feeling is slightly good.
3 -- A thick feeling is common.
2 -- A thick feeling is slightly poor.
1 -- A thick feeling is poor.
[0048](5) The biodegradable nonwoven fabric or the sheet was laid under a depth of 25 cm among the ground of the outdoors of 1-10-6, Shinonome, Koto-ku, Tokyo and the NEW OJI PAPER Tokyo, Inc. goods research institute, and viewing estimated the nonwoven fabric of six months after, or the shape change of the sheet. Evaluation was performed in the following two steps.
x -- Although decomposition of a pulp fiber is accepted, decomposition of a continuous glass fiber nonwoven fabric portion is not accepted. Or decomposition of textiles is not accepted when the pulp sheet is not used.
O -- Decomposition is accepted to be any portions of a pulp fiber and a continuous glass fiber nonwoven fabric. Or decomposition of textiles is accepted when the pulp sheet is not used.
The above-mentioned test result of Example 1 - the comparative example 6 is shown in Table 1.
[0049]
[Table 1]

	吸水性	ハンドリング性（湿潤状態）	加工性（乾燥状態）	厚手感	生分解性
実施例1	5	5	5	5	○
実施例2	5	5	5	5	○
実施例3	5	5	5	5	○
実施例4	5	5	5	5	○
実施例5	5	5	5	5	○
実施例6	5	5	5	5	○
実施例7	5	5	5	5	○
比較例1	5	5	2	5	×
比較例2	5	2	2	2	○
比較例3	4	2	3	2	○
比較例4	5	2	3	2	○
比較例5	5	2	2	5	○
比較例6	1	崩壊せず	3	3	×

[0050]The composite nonwoven fabric of this invention was excellent in absorptivity, had stiffness suitable for processing or handling, and it not only has suitable pliability and good handling nature, but all had a thick feeling and biodegradability by the damp or wet condition at dryness so that clearly from Table 1. On the other hand, in the composite nonwoven fabric (comparative example 1) using a polypropylene spun bond nonwoven fabric, a polypropylene fiber did not have biodegradability, and since it was flexible, processability was inferior in dryness, although excelled in absorptivity, the handling nature in a damp or wet condition, and a thick feeling. In the composite nonwoven fabric (comparative example 2) with a low ratio of a pulp sheet, although biodegradability is good and was excellent in absorptivity, since the rate of the pulp fiber in a nonwoven fabric was low, a thick feeling and the handling nature in the damp or wet condition were inferior, and in dryness, stiffness ran short and it was inferior to processing or handling nature.

[0051]In the composite nonwoven fabric (comparative example 3) using a high-density pulp sheet. Since the density of a pulp sheet was too high, even if it performed high-pressure-water pillar style processing, a pulp fiber was not fully isolated from a pulp sheet, but it became insufficient interlacing with a pulp fiber and cuprammonium rayon continuous glass fiber, absorptivity was good, and the processability in dryness was common, but. It was inferior to the handling nature in a thick feeling and a damp or wet condition. Although the nonwoven fabric (comparative example 4) which consists only of cuprammonium rayon continuous glass fiber has biodegradability and it excelled in absorptivity, handling nature is inferior also in the state of any of dryness and a damp or wet condition.

The thick feeling was also poor.

Although the mat state sheet (comparative example 5) of a rayon staple fiber has biodegradability and was excellent in absorptivity and a thick feeling, by dryness, since pliability was high, it was inferior to processability, and inferior to the handling nature in the damp or wet condition. Although the handling nature and the processability in dryness of the polypropylene spun bond nonwoven fabric (comparative example 6) were common, biodegradability and absorptivity are not almost.

[0052]

[Effect of the Invention]So that clearly from the above-mentioned explanation the cuprammonium rayon continuous glass fiber composite nonwoven fabric of this invention, Biodegradability is good, and is excellent in absorptivity and a thick feeling, and it has the stiffness which was suitable for various processings at the time of desiccation, Since the cuprammonium rayon continuous glass fiber and the pulp fiber which have moderate pliability and good handling nature at the time of humidity, and constitute a nonwoven fabric are carrying out the slip coalition efficiently, there are few rear surface differences and they are excellent in practicality.

this invention method makes it possible to manufacture industrially the above-mentioned cuprammonium rayon continuous glass fiber composite nonwoven fabric efficiently.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1]A cuprammonium rayon continuous glass fiber composite nonwoven fabric which it has the following and cuprammonium rayon continuous glass fiber in said cuprammonium rayon continuous glass fiber layer interlaces mutually, and advances into said pulp fiber layer, interlaces also with the pulp fiber, and is characterized by forming three-dimensional interlaced structure of said cuprammonium rayon continuous glass fiber and a pulp fiber of it.
A pulp fiber layer which consists of wood pulp fibers.
At least one-layer cuprammonium rayon continuous glass fiber layer which is laminated on the 1st [at least] page of this pulp fiber layer, and consists of cuprammonium rayon continuous glass fiber.

[Claim 2]From many spinning holes, extrude a cuprammonium rayon undiluted solution and a filament shape style of a cuprammonium rayon undiluted solution of these extruded large number, Form a curtain wall-like style with a solidified solution which contacts it and is solidified, and this curtain wall-like style, going on to a certain direction. It is made to flow down to this direction of movement on a base material rocked in the direction which crosses almost horizontally, On this base material, a textiles lamination layer sheet-like thing of solidified cuprammonium rayon continuous glass fiber is formed, Spurt out and apply many high-pressure-water pillar styles to said sheet like object, and said cuprammonium rayon continuous glass fiber mutually, Make it confound at random, dry an acquired cuprammonium rayon continuous glass fiber sheet-shaped interlaced object, and a cuprammonium rayon continuous glass fiber nonwoven fabric is produced, Carry out wet paper making of the wood pulp independently, produce a pulp fiber sheet, and on the 1st [at least] page of said pulp fiber sheet, A manufacturing method of a cuprammonium rayon continuous glass fiber composite nonwoven fabric characterized by what laminate said cuprammonium rayon continuous glass

fiber nonwoven fabric, spurt out and apply a high-pressure-water pillar style to this layered product from at least oneth side of them, a pulp fiber and said cuprammonium rayon continuous glass fiber in said layered product are made to confound in three dimensions, and a composite nonwoven fabric of one is formed for.

[Translation done.]